City of St. Clair Shores Employees Retirement System

69th Actuarial Valuation Report

as of June 30, 2021

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November 2, 2021

Retirement Board
City of St. Clair Shores
Employees Retirement System
St. Clair Shores, Michigan

Re: City of St. Clair Shores Employees Retirement System Actuarial Valuation as of June 30, 2021 Actuarial Disclosures

Dear Board Members:

The results of the June 30, 2021 Annual Actuarial Valuation of the City of St. Clair Shores Employees Retirement System are presented in this report.

This report was prepared at the request of the Board and is intended for use by the System and those designated or approved by the Board. This report may be provided to parties other than the System only in its entirety and only with the permission of the Board. GRS is not responsible for unauthorized use of this report.

The purposes of the valuation are to measure the System's funding progress, and to determine the employer contribution rate for the fiscal year ending June 30, 2022. This report should not be relied on for any purpose other than the purposes described herein. Determinations of financial results, associated with the benefits described in this report, for purposes other than those identified above may be significantly different.

The contribution rate in this report is determined using the actuarial assumptions and methods disclosed in Section C of this report. This report includes risk metrics shown in Appendix 2, but does not include a more robust assessment of the risks of future experience not meeting the actuarial assumptions. Additional assessment of risks was outside the scope of this assignment.

This valuation assumed the continuing ability of the plan sponsor to make the contributions necessary to fund this plan. A determination regarding whether or not the plan sponsor is actually able to do so is outside our scope of expertise and was not performed.

The findings in this report are based on data and other information through June 30, 2021. The valuation was based upon information furnished by the Plan Administrator, concerning Retirement System benefits, financial transactions, plan provisions and active members, terminated members, retirees and beneficiaries. We checked for internal reasonability and year-to-year consistency, but did not audit the data. We are not responsible for the accuracy or completeness of the information provided by the Plan Administrator.

This report was prepared using assumptions adopted by the Board and first used in the June 30, 2016 actuarial valuation. All actuarial assumptions used in this report are reasonable for the purposes of this valuation. All actuarial assumptions and methods used in the valuation follow the guidance in the applicable Actuarial Standards of Practice. Additional information about the actuarial assumptions is included in the section of this report entitled Valuation Methods and Assumptions.

This report was prepared using our proprietary valuation model and related software which in our professional judgment has the capability to provide results that are consistent with the purposes of the valuation and has no material limitations or known weaknesses. We performed tests to ensure that the model reasonably represents that which is intended to be modeled.

This report has been prepared by actuaries who have substantial experience valuing public employee retirement systems. To the best of our knowledge, the information contained in this report is accurate and fairly presents the actuarial position of the City of St. Clair Shores Employees Retirement System as of the valuation date. All calculations have been made in conformity with generally accepted actuarial principles and practices and the Actuarial Standards of Practice issued by the Actuarial Standards Board.

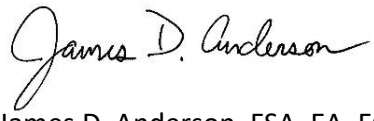
James D. Anderson and Mark Buis are members of the American Academy of Actuaries. These actuaries meet the Academy's Qualification Standards to render the actuarial opinions contained herein.

The signing actuaries are independent of the plan sponsor.

Gabriel, Roeder, Smith & Company will be pleased to review this valuation report with the Board of Trustees and to answer any questions pertaining to the valuation.

Respectfully submitted,

GABRIEL, ROEDER, SMITH & COMPANY



James D. Anderson, FSA, EA, FCA, MAAA

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JDA/MB:dj

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SECTION A

VALUATION RESULTS

Funding Objective

The funding objective of the Retirement System is to establish and receive sufficient contributions which will accumulate assets during each member's working years which, together with investment income, will be sufficient to pay promised benefits after retirement.

Contributions

The Retirement System is supported by member contributions, City's contributions and investment income from Retirement System assets.

Contributions which satisfy the funding objective are determined by the annual actuarial valuation and are sufficient to:

(1) Cover the actuarial costs allocated to the current year by the actuarial cost methods described in Section C (the normal cost); and

(2) Finance over a period of future years the actuarial cost not covered by present assets and anticipated future normal costs (unfunded actuarial accrued liability).

Contribution requirements for the fiscal year beginning July 1, 2022 are shown on page A-2.

The Board of Trustees of the City of St. Clair Shores Employees Retirement System confirms that the System provides for payment of the required employer contribution as described in Section 20m of Michigan Public Act No. 728.

City's Computed Contributions

Contributions for	For Fiscal Year Beginning July 1, 2022	2021
NORMAL COST		
Age and service pensions	$ 322,224	$ 345,479
Death before retirement pensions	9,631	10,549
Disability pensions	19,537	21,098
Total	351,392	377,126
MEMBERS' CONTRIBUTIONS		
Gross contributions	22,289	23,735
Less prospective refunds	2,752	2,930
Available for pensions	19,537	20,805
CITY'S NORMAL COST	331,855	356,321
AMORTIZATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITIES#	$2,317,843	$2,347,791
TOTAL CITY CONTRIBUTIONS *^	$2,649,698	$2,704,112

 # Unfunded actuarial accrued liabilities were financed as a level dollar amount over a period of 20 years (21 years for the fiscal year beginning July 1, 2021).

** Contribution amounts for prior fiscal years are shown on page A-6.*

^ The estimated contribution as a percentage of payroll for the fiscal year beginning July 1, 2022 is 96.3%. This estimated contribution is for informational purposes only and is based on projected payroll of $2,751,703. The Plan is closed to new hires and it is our understanding the City makes contributions on the dollar basis noted above. To the extent that actual payroll is different, the actual percentage will vary.

Determination of Unfunded Actuarial Accrued Liability

	June 30, 2021	June 30, 2020
A. Accrued Liability		
1. For retirees and beneficiaries	$ 47,811,552	$ 47,752,703
2. For vested terminated members	2,075,339	1,872,562
3. For present active members		
a. Value of expected future benefit payments	21,020,409	19,771,532
b. Value of future normal costs	2,048,111	2,228,210
c. Active member accrued liability: (a) - (b)	18,972,298	17,543,322
4. Total accrued liability	68,859,189	67,168,587
B. Present Assets (Funding Value)	43,799,753	41,310,603
C. Unfunded Accrued Liability: (A.4) - (B)	25,059,436	25,857,984
D. Funding Ratio: (B) / (A.4)	63.6%	61.5%
E. Funding Ratio: Market Value Basis	71.1%	58.7%

Development of Funding Value of Assets

Year Ended June 30:	2020	2021	2022	2023	2024
A. Funding Value Beginning of Year	$40,479,263	$41,310,603			
B. Market Value End of Year	39,443,783	48,926,647			
C. Market Value Beginning of Year	40,596,798	39,443,783			
D. Non-Investment Net Cash Flow	(2,015,908)	(2,113,406)			
E. Investment Income					
E1. Market Total: B - C - D	862,893	11,596,270			
E2. Assumed Rate of Investment Return	7.50%	7.50%			
E3. Amount for Immediate Recognition	2,960,348	3,019,043			
E4. Amount for Phased-In Recognition: E1-E3	(2,097,455)	8,577,227			
F. Phased-In Recognition of Investment Income					
F1. Current Year: 0.25 x E4	(524,364)	2,144,307			
F2. First Prior Year	(257,298)	(524,364)	$ 2,144,307		
F3. Second Prior Year	220,869	(257,298)	(524,364)	$ 2,144,307	
F4. Third Prior Year	447,693	220,868	(257,299)	(524,363)	$ 2,144,306
F5. Total Recognized Investment Gain (Loss)	(113,100)	1,583,513	1,362,644	1,619,944	2,144,306
G. Funding Value End of Year: A + D + E3 + F5	41,310,603	43,799,753			
H. Difference between Market and Funding Value	(1,866,820)	5,126,894			
I. Recognized Rate of Return - Funding Value	7.21%	11.43%			
J. Recognized Rate of Return - Market Value	2.18%	30.21%			

The Funding Value of Assets recognizes assumed investment income (line E.3) fully each year. Differences between actual and assumed investment income (line E.4) are phased-in over a closed four-year period. During periods when investment performance exceeds the assumed rate, Funding Value of Assets will tend to be less than Market Value. During periods when investment performance is less than the assumed rate, Funding Value of Assets will tend to be greater than Market Value. The Funding Value of Assets is unbiased with respect to Market Value. At any time it may be either greater or less than Market Value. If actual and assumed rates of investment income are exactly equal for three consecutive years, the Funding Value will become equal to Market Value.

Derivation of Experience Gain (Loss)

Actual experience will never (except by coincidence) coincide exactly with assumed experience. It is expected that gains and losses will cancel each other over a period of years, but sizable year-to-year fluctuations are common. Detail on the derivation of the experience gain (loss) is shown below, along with a year-by-year comparative schedule.

(1)	UAAL* at start of year	$ 25,857,984
(2)	Total normal cost	429,394
(3)	Actual contributions for pensions	2,923,884
(4)	Interest accrual ((1) + 1/2 [(2)-(3)]) x 7.50%	1,845,805
(5)	Expected UAAL* before changes (1) + (2) - (3) + (4)	25,209,299
(6)	Change from benefit improvements	0
(7)	Change in actuarial assumptions	0
(8)	Expected UAAL* after changes (5) + (6) + (7)	25,209,299
(9)	Actual UAAL*	25,059,436
(10)	Gain (Loss) (8) - (9)	$ 149,863
(11)	Gain (Loss) as percent of actuarial accrued liabilities at start of year ($67,168,587)	0.2%

* *Unfunded Actuarial Accrued Liabilities.*

Valuation Date	Experience Gain (Loss) as % of Beginning Accrued Liability
6-30-12	(4.1) %
6-30-13	(0.4)
6-30-14	0.8
6-30-15	(2.3)
6-30-16	(1.3)
6-30-17	(0.9)
6-30-18	(1.5)
6-30-19	(0.3)
6-30-20	(0.1)
6-30-21	0.2

Comparative Schedule and Risk Factors

Valuation Date	Actuarial Accrued Liabilities & Reserves	Valuation Assets	Percent Funded	Unfunded Actuarial Accrued Liabilities & Reserves Dollars	Amortization Period	City's Contribution	Covered Payroll
06/30/12	$56,805,539	$36,435,503	64.1 %	$ 20,370,036	21 yrs.	$2,561,038	$5,299,757
06/30/13	57,648,592	37,291,564	64.7	20,357,028	20	2,512,506	4,599,115
06/30/14	58,329,977	38,900,248	66.7	19,429,729	19	2,462,821	4,611,639
06/30/15	59,991,212	39,768,186	66.3	20,223,026	18	2,554,204 #	4,282,301
06/30/16	65,444,267	39,907,111	61.0	25,537,156	25	2,644,314 #	4,261,711
06/30/17	66,167,017	40,232,995	60.8	25,934,022	24	2,680,039	4,118,454
06/30/18	66,672,079	40,085,435	60.1	26,586,644	23	2,755,364	4,045,968
06/30/19	66,870,615	40,479,263	60.5	26,391,352	22	2,757,840 *	3,831,965
06/30/20	67,168,587	41,310,603	61.5	25,857,984	21	2,704,112	3,428,483
06/30/21	68,859,189	43,799,753	63.6	25,059,436	20	2,649,698	3,324,623

* *Retirement System amended.*
\# *Revised actuarial assumptions and/or methods.*

Percent Funded is the Ratio of Valuation Assets to Actuarial Accrued Liabilities. This is a traditional measure of a system's funding progress. Except in years when the system is amended or actuarial assumptions are revised, this ratio can be expected to increase gradually toward 100%.

Schedule of Employer Contributions

Fiscal Yr. Ended June 30	Val. Yr. Ended June 30	Computed Dollar Contribution Based on Valuation Payroll	Annual Required Contribution Based on Actual Payroll
2014	2012	$ 2,561,038	$ 2,561,038
2015	2013	2,512,506	2,512,506
2016	2014	2,462,821	2,462,821
2017	2015 #	2,554,204	2,554,204
2018	2016 #	2,644,314	2,644,314
2019	2017	2,680,039	2,814,041
2020	2018	2,755,364	2,893,132
2021	2019 *	2,757,840	2,895,732
2022	2020	2,704,112	-
2023	2021	2,649,698	-

* *Retirement System amended.*
\# *Revised actuarial assumptions and/or methods.*

Comments

Actuarial Experience

The Actuarially determined employer contribution decreased from $2,704,112 last year to $2,649,698 this year. This was primarily attributable to favorable investment experience.

Plan Amendments

There were no changes to plan provisions since the previous valuation.

Public Act 202

Under Public Act 202 of the State of Michigan, Michigan municipalities are be required to report liabilities under uniform assumption guidelines. While the current guidelines are currently only for reporting purposes (and not funding), City governments will be encouraged to use these new assumptions for funding.

The uniform assumptions for 2021 reporting include the following:

- Investment return no higher than 7.0%;
- Assumed wage inflation no lower than 3.0%;
- Mortality assumption that uses a version of Pub-2010 with generational mortality improvement using scale MP-2019, or based on an experience study within the last five years; and
- Amortization period no longer than 18 years for Pension Plans.

The information needed to assist with PA 202 reporting requirements was supplied in the GASB report.

Looking Ahead

This report reflects the impact of COVID-19 experience through June 30, 2021. It does not reflect the ongoing impact of COVID-19, which is likely to influence demographic and economic experience, at least in the short term. We will continue to monitor these developments and their impact on the Retirement System. Actual experience will be reflected in each subsequent annual valuation, as experience emerges.

Experience Review

The last experience review was completed in August of 2016 and reflected in the June 30, 2016 actuarial valuation. We recommend that a formal experience study be completed for the System to ensure that assumptions going forward are consistent with long-term expectations with regard to both economic and demographic trends. New State laws passed in late 2017 now require an experience study every five years. Our understanding is that the Board will consider authorizing such a study at its October 2022 Board meeting.

Comments (Continued)

The current 7.5% investment return assumption is at the very upper end of the range of reasonability based on investment consultant forecasts of future expected return for the System's asset allocation. Unless investment market forecasts change, this assumption may not be supportable next year (and may receive auditor push-back this year). The investment return assumption is the actuarial assumption which has the largest impact on actuarial valuation results. Public Plans have experienced continued downward pressure on the assumed rate of investment return. Below we have included an illustration of the impact to the Plan of an alternative assumed rate of investment return in conjunction with a one-time reset of the funding value of assets to the market value. We offer the illustration for Board consideration. Implementation at a June 30, 2021 valuation date allows the Plan to offset a portion of the impact with the better than assumed actual investment experience. Should the Board adopt the alternate assumption illustration this would not eliminate the need for an experience study.

	For Fiscal Year Beginning July 1, 2022	
Assumed Rate of Investment Return	**7.5%**	**7.0%**
City's Computed Contributions		
City's Normal Cost	$ 331,855	$ 378,875
Unfunded Actuarial Accrued Liabilities	2,317,843	2,032,323
Total City Contributions	2,649,698	2,411,198
Determination of Unfunded Actuarial Accrued Liability		
A. Accrued Liability	$ 68,859,189	$ 72,014,589
B. Present Assets (Funding Value)*	43,799,753	48,926,647
C. Unfunded Accrued Liability: (A) - (B)	25,059,436	23,087,942
D. Funding Ratio: (B) / (A)	63.6%	67.9%

* Reset to Market Value Assets as of June 30, 2021 for the column relating to use of a 7% assumed rate of investment return.

Reserves

We understand that the Board approved a motion, November 19, 2019, to authorize a transfer of funds from the Reserve for Employer Contributions to the Reserve for Retired Benefit Payments, as recommended by the Actuary, any time there is a shortfall in the Retired Benefit Payment Reserve.

As of June 30, 2021, the Reserve for Retired Benefit Payments is currently in shortfall at $(6,093,897). We recommend a transfer of assets from the Reserve for Employer Contributions to the Reserve for Retired Benefit Payments in the amount of $31,097,657, to the extent possible. This amount was developed as follows:

1. Amount to Eliminate Shortfall	$6,093,897
2. 5 x Benefit Payments as of Valuation Date	25,003,760
3. Preliminary Transfer Amount (1. + 2.)	31,097,657
4. Retiree and Beneficiary Liability	47,811,552
5. Final Transfer Amount (Minimum (3., 4.))	31,097,657

Following the above method has the benefits of:

1) Administrative Ease – A transfer is only needed when in shortfall and the developed transfer includes a cushion
2) Transparency of Method – All amounts needed to calculate the transfer can be found in the valuation report.
3) Safe Guards – Included a maximum on the amount recommended for transfer, keeps the retired reserve in line with the projected value of benefits.

Comments (Concluded)

Certification

To the best of our knowledge and belief, the valuation is complete and accurate and was made in accordance with generally recognized actuarial methods. The actuarial assumptions summarized in Section C are individually and, in the aggregate, a reasonable representation of the past and anticipated future experience of the System.

Other Observations

General Implications of Contribution Allocation Procedure or Funding Policy on Future Expected Plan Contributions and Funded Status

Given the Plan's contribution allocation procedure, if all actuarial assumptions are met (including the assumption of the plan earning 7.5% on the actuarial value of assets), it is expected that:

1) Employer normal cost dollar amounts will eventually decrease as active payroll declines due to the closed nature of the plan;
2) Amortization payment dollar amounts will remain level over the next 20 years;
3) The unfunded actuarial accrued liability will be fully amortized after 20 years; and
4) The funded status of the plan will increase gradually towards a 100% funded ratio.

Limitations of Funded Status Measurements

Unless otherwise indicated, a funded status measurement presented in this report is based upon the actuarial accrued liability and the actuarial value of assets. Unless otherwise indicated, with regards to any funded status measurements presented in this report:

1) The measurement is inappropriate for assessing the sufficiency of Plan assets to cover the estimated cost of settling the plan's benefit obligations.
2) The measurement is inappropriate for assessing the need for or the amount of future employer contributions.
3) The measurement would produce a different result if the market value of assets were used instead of the actuarial value of assets, unless the market value of assets is used in the measurement.
4) The funding level of the Plan on a Market Value basis is shown on page A-3.

SECTION B

VALUATION DATA

Brief Summary of Benefit Provisions
(June 30, 2021)

Regular Retirement (No reduction factor for age)

Eligibility – Age 50 with 25 years of service, or age 60 with 10 or more years of service.

Annual Amount – **AFSCME, Court Non-Union, Court Clerical, and PEA:** Total service multiplied by 2.5% of average final compensation with a maximum of 80% of average final compensation.

Dispatchers: Total service multiplied by 2.5% of average final compensation with a maximum of 75% of average final compensation.

AR4: Total service multiplied by 2.5% of average final compensation with a maximum of 70% of average final compensation. Maximum benefit for AR4 members cannot exceed base pay as of termination date.

Type of Average Final Compensation – Highest 5 non-consecutive years out of last 10. Court Clerical and Dispatchers – Highest 5 consecutive years out of last 10.

Deferred Retirement (Vested Benefit)

Eligibility – 10 years of service, benefit begins at age 60.

Annual Amount – Computed as regular retirement but based on average final compensation and service at time of termination.

Duty Disability Retirement

Eligibility – No age or service requirement.

Annual Amount – Computed as regular retirement with a minimum benefit of 20% of average final compensation. Upon termination of worker's compensation or age 60, whichever occurs first, benefit is recomputed to include additional service credit for the period worker's compensation was paid.

Non-Duty Disability Retirement

Eligibility – 10 or more years of service.

Annual Amount – Computed as regular retirement.

Death-in-Service Survivor Pension

Eligibility – 10 years of service.

Annual Amount – Computed as regular retirement but actuarially reduced in accordance with a 100% joint and survivor election.

Brief Summary of Benefit Provisions
(June 30, 2021)
(Concluded)

Post-Retirement Cost-of-Living Adjustments

Retirees effective 7/1/93 (Court Clerical effective 1/1/03): 5% cost-of-living increase at age 60 or five years after retirement, whichever is later, with a second increase of 5% five years after the first increase.

Member Contributions

AR4 and Court Non-Union:	None
AFSCME, Court Clerical, Dispatchers, and PEA:	1.0% of pay

City's Contributions

Actuarially determined amounts which are sufficient to at least cover the requirements of the funding objective stated on page A-1.

New Hires

The Plan is closed. No new hires will participate in this Retirement System.

Summary of Asset Information Furnished for the Valuation Balance Sheet as of June 30, 2021

Current Assets		Reserves for	
Cash & Equivalents	$ 4,633,665	Employees' Contributions	$ 565,792
Receivables & Accruals	52,612	Employer Contributions	53,467,813
Bonds	0	Retired Benefit Payments	(6,093,897)
Common Stocks	32,176,933	Excess Earnings Reserve	986,939
ADR	0		
Foreign Stocks	337,762		
Real Estate	602,923		
Mortgages	0		
Foreign Gov. & Agencies	0		
Other Fixed Income	11,068,743		
Other Assets (Securities lending)	1,288,326		
Other Assets (Partnerships, Publicly Traded)	125,355		
Accounts payable	(57,474)		
Amount due to Broker (Securities lending)	(1,302,198)		
Total Current Assets	$ 48,926,647	Total Reserves	$ 48,926,647
Market Adjustment*	(5,126,894)	Market Adjustment*	(5,126,894)
Total Valuation Assets**	$ 43,799,753	Total Valuation Assets**	$ 43,799,753

* *See page A-4 for derivation of the market adjustment.*

** *Includes the Excess Earnings Reserve.*

Revenues and Expenditures

Balance July 1, 2020	$ 41,310,603
Revenues	
Employees' contributions	28,152
Employer contributions	2,895,732
Medicare reimbursement#	399,119
Recognized investment income (valuation purposes)	4,602,556
Expenditures	
Benefit payments	5,037,290
Refund of member contributions	0
Medicare payments#	399,119
Balance June 30, 2021	$ 43,799,753

 # Medicare payments to retirees are paid monthly by the custodian from the Retirement System's assets. At the end of each quarter, these amounts are reimbursed to the System by the City.

Retiree and Beneficiary Comparative Schedule

Year Ended June 30	Added to Rolls No.	Added to Rolls Annual Pensions	Removed from Rolls No.	Removed from Rolls Annual Pensions	Rolls End of Year No.	Active Per Retired	Annual Pensions Dollars	Annual Pensions % of Pay*	% Incr. in Annual Pensions	Average Pension	Expected Removals No.	Expected Removals $
1997	11	$ 162,889	8	$ 78,664	176	0.9	$ 1,997,115	31.6 %	4.4 %	$ 11,347	5.7	$ 48,811
1998	9	187,510	6	43,223	179	0.9	2,141,402	32.8	7.2	11,963	6.2	53,260
1999	16	289,747	12	163,410	183	0.9	2,267,739	32.0	5.9	12,392	5.6	49,841
2000	6	163,121	8	66,733	181	1.0	2,364,127	31.3	4.3	13,061	5.8	52,574
2001	8	147,094	5	38,062	184	0.9	2,473,159	33.8	4.6	13,441	5.9	56,028
2002	9	190,085	11	88,107	182	0.9	2,575,137	32.7	4.1	14,149	6.0	57,982
2003	8	233,641	4	30,096	186	0.8	2,778,682	37.9	7.9	14,939	6.0	61,381
2004	15	454,673	10	96,771	191	0.8	3,136,584	45.0	12.9	16,422	6.5	66,604
2005	14	440,795	10	51,437	195	0.7	3,525,942	54.0	12.4	18,082	6.7	70,640
2006	6	230,143	9	128,414	192	0.7	3,627,671	53.5	2.9	18,894	7.2	84,343
2007	14	271,387	8	69,238	198	0.6	3,829,820	58.4	5.6	19,343	7.3	89,201
2008	6	108,961	5	19,817	199	0.6	3,918,964	59.0	2.3	19,693	7.6	96,874
2009	5	101,229	6	90,820	198	0.6	3,929,373	58.4	0.3	19,845	7.2	90,602
2010	12	206,333	6	72,949	204	0.5	4,062,757	63.8	3.4	19,915	7.7	98,271
2011	12	225,699	6	98,440	210	0.5	4,190,016	71.4	3.1	19,952	8.4	107,628
2012	8	190,569	5	85,405	213	0.4	4,295,180	81.0	2.5	20,165	9.0	114,822
2013	18	444,226	14	195,321	217	0.4	4,544,085	98.8	5.8	20,940	9.6	123,626
2014	7	176,718	10	118,734	214	0.4	4,602,069	99.8	1.3	21,505	9.4	129,877
2015	7	154,294	11	113,586	210	0.3	4,642,777	108.4	0.9	22,108	9.4	135,332
2016	10	230,088	8	199,859	212	0.3	4,673,006	109.7	0.7	22,042	9.5	143,393
2017	6	177,886	8	103,749	210	0.3	4,747,143	115.3	1.6	22,605	9.2	141,963
2018	6	174,983	8	150,498	208	0.3	4,771,628	117.9	0.5	22,941	9.2	145,448
2019	13	312,757	18	303,008	203	0.3	4,781,377	124.8	0.2	23,554	9.2	147,241
2020	10	263,340	7	96,257	206	0.2	4,948,460	144.3	3.5	24,022	8.1	137,648
2021	5	168,930	8	116,638	203	0.2	5,000,752	150.4	1.1	24,634	8.2	144,621

** Pay used for this purpose is the payroll for the now closed group of active members.*

Retiree and Beneficiary Data June 30, 2021
Tabulated by Type of Pensions Being Paid

Type of Pensions Being Paid	No.	Annual Pensions
Age and Service Pensions		
Regular pension - benefit Terminating at death of retirant	70	$1,750,681
Option A pension - joint and survivor benefit	61	1,761,967
Option B pension - modified joint and survivor benefit	22	679,187
Survivor beneficiary of deceased age and service retiree	27	464,681
Other - benefit being paid to an ex-spouse	11	118,391
Total age and service pensions	191	$4,774,907
Casualty Pensions		
Duty disability		
Regular pension	2	$ 35,190
Non-Duty Disability pensions		
Regular pension	5	93,066
Option A pension		
Option B pension	1	10,617
Survivor beneficiary of deceased non-duty disability retiree	2	6,430
Total	8	110,113
Non-duty death - spouse	2	80,542
Total casualty pensions	12	225,845
Total Pensions Being Paid	203	$5,000,752

Retiree and Beneficiary Data June 30, 2021
Tabulated by Age

Attained Age	No.	Annual Pensions
50 - 54	2	$ 12,106
55 - 59	7	180,096
60 - 64	26	750,868
65 - 69	45	1,353,678
70 - 74	46	1,232,579
75 - 79	27	690,353
80 - 84	14	340,727
85 - 89	17	202,205
90+	19	238,140
Totals	**203**	**$5,000,752**

Average Age at Retirement: 58.0 years.
Average Age Now: 74.0 years.

Inactive Vested Members June 30, 2021
Tabulated by Age

Age	No.	Estimated Deferred Annual Pensions
Under 45	1	$ 13,711
45 - 49	1	6,691
50 - 54	6	134,107
55 - 59	9	119,354
Totals	**17**	**$273,863**

Average Age Now: 54.3 years

Comparative Schedules
Active Members in Valuation

Valuation Date June 30	Active Members	Valuation Payroll	Average Age	Average Service	Average Pay	Average % Inc.
1997	163	$6,311,705	44.5 yrs.	12.2 yrs.	$38,722	5.0 %
1998	162	6,520,030	44.7	12.2	40,247	3.9
1999	167	7,090,025	44.4	11.1	42,455	5.5
2000	173	7,543,720	44.5	11.2	43,605	2.7
2001	169	7,316,759	45.1	11.5	43,294	(0.7)
2002	169	7,868,956	45.8	11.5	46,562	7.5
2003	154	7,324,919	46.6	11.4	47,564	2.2
2004	145	6,969,930	46.7	11.1	48,068	1.1
2005	134	6,532,301	47.0	10.7	48,749	1.4
2006	134	6,783,425	47.5	10.6	50,623	3.8
2007	124	6,557,936	47.2	11.4	52,887	4.5
2008	121	6,647,356	47.5	12.1	54,937	3.9
2009	117	6,726,665	48.3	12.8	57,493	4.7
2010	109	6,371,328	48.8	13.6	58,453	1.7
2011	98	5,865,873	49.0	14.6	59,856	2.4
2012	92	5,299,757	49.5	15.2	57,606	(3.8)
2013	78	4,599,115	48.8	15.6	58,963	2.4
2014	75	4,611,639	49.4	16.4	61,489	4.3
2015	67	4,282,301	49.8	17.1	63,915	3.9
2016	66	4,261,711	50.6	18.1	64,571	1.0
2017	62	4,118,454	51.2	18.8	66,427	2.9
2018	59	4,045,968	52.0	19.6	68,576	3.2
2019	55	3,831,965	52.1	20.5	69,672	1.6
2020	47	3,428,483	52.2	20.8	72,946	4.7
2021	44	3,324,623	52.5	21.8	75,560	3.6

Active Members Added to and Removed from Rolls

Year Ended	Number Added During Year A	Number Added During Year E	Terminations During Year: Normal Retirement A	Normal Retirement E	Disability Retirement A	Disability Retirement E	Died-in-Service A	Died-in-Service E	Withdrawal: Vested A	Withdrawal: Other A	Withdrawal: Total A	Withdrawal: Total E	Active Members End of Year
06/30/17	0	0	4	6.7	0	0.3	0	0.1	0	0	0	1.1	62
06/30/18	0	0	3	6.8	0	0.2	0	0.1	0	0	0	1.0	59
06/30/19	0	0	4	7.4	0	0.2	0	0.1	0	0	0	0.9	55
06/30/20	0	0	7	6.8	0	0.2	0	0.1	1	0	1	0.8	47
06/30/21	0	0	3	5.3	0	0.2	0	0.1	0	0	0	0.7	44

A Represents actual number.
E Represents expected number.

Active Members June 30, 2021
by Age and Years of Service

	Years of Service to Valuation Date							Totals	
Age	**0-4**	**5-9**	**10-14**	**15-19**	**20-24**	**25-29**	**30 & Up**	**No.**	**Salary**
35-39				2				2	$ 165,476
40-44			1	3	2			6	401,938
45-49				4	6	1		11	772,151
50-54					5			5	357,760
55-59				4	6	1		11	805,466
60					1			1	110,373
61			1					1	48,853
62					1		1	2	180,291
63							1	1	95,919
64					1		1	2	177,511
65+					1	1		2	208,885
Totals			**2**	**13**	**23**	**3**	**3**	**44**	**$3,324,623**

While not used in the financial computations, the following group averages are computed and shown because of their general interest.

Age: 52.5 years
Service: 21.8 years
Annual Pay: $75,560

SECTION C

VALUATION METHODS AND ASSUMPTIONS

Actuarial Cost Method

The actuarial cost method is the procedure for allocating the actuarial present value of benefits and expenses to time periods. The method used for your valuation is known as the ***individual entry-age actuarial cost method,*** and has the following characteristics:

- The annual normal cost for each individual active member is sufficient to accumulate the value of the member's pension at the time of retirement.

- Each annual normal cost is a constant percentage of the member's year-by-year projected pensionable compensation.

The unfunded actuarial accrued liability was financed as a level dollar of member payroll over a period of 20 years. This unfunded actuarial accrued liability payment reflects any payment expected to be made between the valuation date and the date contributions determined by this report are scheduled to begin.

The valuation assets used for funding purposes are derived as follows: prior year valuation assets are increased by contribution and expected investment income (net of expenses) and reduced by refunds and benefit payments. To this amount is added 25% of the difference between expected and actual investment income for each of the previous four years.

Excess Earning Reserve: An amount equal to the projected market value of the Excess Earning Reserve is added to the liabilities to assure proper allocation of assets to liabilities.

Actuarial Assumptions Used for the Valuation

The contribution requirements and benefit values of the System are calculated by applying actuarial assumptions to the benefit provisions and demographic information furnished by the Plan Sponsor, using the actuarial cost method described on the previous page.

The principal areas of financial risk which require assumptions about future experiences are:

- Long-term rates of investment return to be generated by the assets of the System.
- Patterns of pay increases to members.
- Rates of mortality among members, retirants and beneficiaries.
- Rates of withdrawal of active members (without entitlement to a retirement benefit).
- Rates of disability among members.
- The age patterns of actual retirements.

The monetary effect of each assumption is calculated for as long as a present covered person survives – a period of time which can be as long as a century.

Actual experience of the System will not coincide exactly with assumed experience. Each valuation provides a complete recalculation of assumed future experience and takes into account all past differences between assumed and actual experience. The result is a continual series of adjustments (usually small) to the computed contribution rate.

Valuation Assumptions

The rate of investment is compounded annually net of expenses.

Investment Return	7.50%
Wage Inflation	3.50%
Price Inflation	2.75%
Spread Between Investment Return and Wage Inflation	4.00%
Spread Between Investment Return and Price Inflation	4.75%

These assumptions are used to equate the value of payments due at different points in time.

Economic experience during the last 5 years has been as follows:

	Year Ending					5-Year
	6/30/21	6/30/20	6/30/19	6/30/18	6/30/17	Average
1) Nominal rate of return[#]	11.4 %	7.2 %	6.3 %	5.1 %	6.5 %	7.3%
2) Increase in CPI	5.4	0.6	1.6	2.9	1.6	2.4%
3) Average salary increase*	3.9	1.9	3.0	2.9	3.0	2.9%
4) Real return:						
- investment purposes	6.0	6.6	4.7	2.2	4.9	4.9%
- funding purposes	7.5	5.3	3.3	2.2	3.5	4.4%
- assumption	4.0	4.0	4.0	4.0	4.0	4.0%

\# *The nominal rate of return was computed using the approximate formula: i = I divided by 1/2 (A+B-I), where I is realized investment income net of expenses, A is the beginning of year asset value and B is the end of year asset value.*

* *Based on members who were active both at the beginning and end of the year.*

Valuation Assumptions (Continued)

The rates of salary increase used for individual members are in accordance with the following table. This assumption is used to project a member's current salary to the salaries upon which benefit amounts will be based.

Sample Ages	Percent Increase in Salary During Next Year	
	Base	Promotion & Seniority
20	3.5 %	3.7 %
25	3.5	3.2
30	3.5	2.7
35	3.5	2.2
40	3.5	1.4
45	3.5	0.7
50	3.5	0.2
55	3.5	0.0

The rates of retirement used to measure the probability of eligible members retiring during the next year were as follows:

Retirement Ages	Percent of Active Members Retiring within Next Year
50	20 %
51	20
52	20
53	20
54	20
55	25
56	25
57	25
58	25
59	25
60	30
61	30
62	30
63	30
64	30
65	100

These rates were first used for the June 30, 2008 valuation.

Valuation Assumptions (Continued)

***Mortality*.** This assumption is used to measure the probabilities of members dying before retirement and the probabilities of each benefit payment being made after retirement. The mortality rates utilized are based upon the RP-2014 tables, as extended, and include a margin for future mortality improvement projected using a fully generational improvement scale. These rates were first used for the June 30, 2016 valuation.

Descriptions of the tables and sample life expectancies are as follows:

- **Healthy Pre-Retirement:** The RP-2014 Employee Generational Mortality Tables, with blue-collar adjustments and extended via cubic spline. This table is adjusted backwards to 2006 with the MP-2014 scale. A base year of 2006 with future mortality improvements assumed each year using scale MP-2015.
- **Healthy Post-Retirement:** The RP-2014 Healthy Annuitant Generational Mortality Tables, with blue-collar adjustments and extended via cubic spline. This table is adjusted backwards to 2006 with the MP-2014 scale. A base year of 2006 with future mortality improvements assumed each year using scale MP-2015.
- **Disability Retirement:** The RP-2014 Disabled Mortality Table, extended via cubic spline. This table is adjusted backwards to 2006 with the MP-2014 scale. A base year of 2006 with future mortality improvements assumed each year using scale MP-2015.

Sample Attained Ages	Healthy Pre- Retirement Future Life Expectancy (Years)*		Healthy Post-Retirement Future Life Expectancy (Years)*		Disabled Retirement Future Life Expectancy (Years)*	
	Men	Women	Men	Women	Men	Women
55	30.77	35.88	29.61	32.48	22.57	26.33
60	25.89	30.86	25.00	27.72	19.41	22.67
65	21.32	25.94	20.62	23.12	16.35	19.04
70	17.11	21.16	16.54	18.75	13.39	15.51
75	13.26	16.59	12.83	14.71	10.62	12.25
80	9.82	12.29	9.59	11.13	8.14	9.43

* *Based on retirements in 2021. Retirements in future years will reflect improvements in life expectancy.*

Valuation Assumptions (Concluded)

Rates of separation from active membership are represented by the following table: (rates do not apply to members eligible to retire and do not include separation on account of death or disability). This assumption measures the probabilities of members remaining in employment.

Sample Ages	Years of Service	% of Active Members Separating within Next Year
ALL	0	15.00 %
	1	12.00
	2	10.00
	3	8.00
	4	6.00
25	5 & Over	5.00
30		5.00
35		4.50
40		3.00
45		2.60
50		1.50
55		1.50
60		1.50

The rates were first used for the June 30, 2008 valuation.

Vested members who terminate with a benefit worth less than 100% of their own accumulated contributions were assumed to forfeit their vested benefit.

Rates of disability are represented by the following table:

Sample Ages	Percent Becoming Disabled within Next Year
20	0.03%
25	0.05%
30	0.07%
35	0.13%
40	0.19%
45	0.28%
50	0.45%
55	0.76%
60	1.10%

These rates were first used for the June 30, 1986 valuation. For purposes of the valuation we assume that all disabilities are ordinary.

Miscellaneous and Technical Assumptions
June 30, 2021

Marriage Assumption:	100% of males and 100% of females are assumed to be married for purposes of Death-in-Service benefits. Male spouses are assumed to be three years older than female spouses.
Pay Increase Timing:	Beginning of the valuation year.
Decrement Timing:	Decrements of all types are assumed to occur mid-year.
Eligibility Testing:	Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur.
Decrement Operation:	All decrements the first five years of service. Only mortality operates during retirement eligibility.
Service Credit Accruals:	It is assumed that members accrue one year of service credit per year.
Incidence of Contributions:	Contributions are assumed to be received continuously throughout the year based upon the computed percent of payroll shown in this report, and the actual payroll payable at the time contributions are made.
Normal Form of Benefit:	Straight life benefit terminating at death of retiree.
Benefit Service:	Exact fractional service is used to determine the amount of benefit payable.
Payroll Adjustment:	Members who did not work the entire plan year had pays adjusted to reasonably reflect a full year's pay.
Assumption Rationale:	Certain actuarial assumptions were based upon the results of an assumption study for the City of St. Clair Shores Employees Retirement System. A report dated August 11, 2016 presented the results of this study. Other assumptions were based upon an experience study dated, September 23, 2008. We believe these assumptions continue to be suitable for purposes of this study.

Glossary

Actuarial Accrued Liability. The difference between (i) the actuarial present value of future plan benefits, and (ii) the actuarial present value of future normal cost. Sometimes referred to as "accrued liability" or "past service liability."

Accrued Service. The service credited under the plan which was rendered before the date of the actuarial valuation.

Actuarial Assumptions. Estimates of future plan experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and salary increases. Decrement assumptions (rates of mortality, disability, turnover and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (salary increases and investment income) consist of an underlying rate in an inflation-free environment plus a provision for a long-term average rate of inflation.

Actuarial Cost Method. A mathematical budgeting procedure for allocating the dollar amount of the "actuarial present value of future plan benefits" between the actuarial present value of future normal cost and the actuarial accrued liability. Sometimes referred to as the "actuarial funding method."

Actuarial Equivalent. A single amount or series of amounts of equal value to another single amount or series of amounts, computed on the basis of the rate(s) of interest and mortality tables used by the plan.

Actuarial Present Value. The amount of funds presently required to provide a payment or series of payments in the future. It is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.

Amortization. Paying off an interest-bearing liability by means of periodic payments of interest and principal, as opposed to paying it off with a lump sum payment.

Experience Gain (Loss). A measure of the difference between actual experience and that expected based upon a set of actuarial assumptions during the period between two actuarial valuation dates, in accordance with the actuarial cost method being used.

Funding Value of Assets. The value of assets derived by spreading the capital value changes (unrealized and realized gain and losses) in equal dollar installments over four years. This treatment removes the timing of investment activities from the valuation process.

Normal Cost. The annual cost assigned, under the actuarial funding method, to current and subsequent plan years. Sometimes referred to as "current service cost." Any payment toward the unfunded actuarial accrued liability is not part of the normal cost.

Glossary (Concluded)

Reserve Account. An account used to indicate that funds have been set aside for a specific purpose and are not generally available for other uses.

Unfunded Actuarial Accrued Liability. The difference between the actuarial accrued liability and valuation assets. Sometimes referred to as "unfunded accrued liability."

Valuation Assets. The value of current plan assets recognized for valuation purposes.

APPENDIX 1

AMORTIZATION PAYOFF SCHEDULE

Amortization Payoff Schedule

Date	Period	Unfunded Liability (BOY)	Funded Ratio (BOY)	UAL Payment $	Interest	Unfunded Liability (EOY)
June 30, 2021		$ 25,059,436	63.6%			
July 1, 2022	20	24,504,652	64.5%	$ 2,317,843	$ 1,751,977	$ 23,938,786
July 1, 2023	19	23,938,786	65.4%	2,317,844	1,709,537	23,330,480
July 1, 2024	18	23,330,480	66.2%	2,317,843	1,663,914	22,676,551
July 1, 2025	17	22,676,551	67.0%	2,317,844	1,614,870	21,973,577
July 1, 2026	16	21,973,577	67.8%	2,317,843	1,562,147	21,217,881
July 1, 2027	15	21,217,881	68.6%	2,317,844	1,505,469	20,405,506
July 1, 2028	14	20,405,506	69.5%	2,317,843	1,444,541	19,532,205
July 1, 2029	13	19,532,205	70.4%	2,317,844	1,379,044	18,593,404
July 1, 2030	12	18,593,404	71.3%	2,317,843	1,308,634	17,584,195
July 1, 2031	11	17,584,195	72.4%	2,317,844	1,232,943	16,499,294
July 1, 2032	10	16,499,294	73.5%	2,317,843	1,151,576	15,333,027
July 1, 2033	9	15,333,027	74.8%	2,317,844	1,064,105	14,079,288
July 1, 2034	8	14,079,288	76.3%	2,317,843	970,075	12,731,520
July 1, 2035	7	12,731,520	78.0%	2,317,844	868,992	11,282,669
July 1, 2036	6	11,282,669	79.9%	2,317,843	760,329	9,725,155
July 1, 2037	5	9,725,155	82.2%	2,317,844	643,515	8,050,826
July 1, 2038	4	8,050,826	84.8%	2,317,843	517,940	6,250,923
July 1, 2039	3	6,250,923	87.8%	2,317,844	382,948	4,316,027
July 1, 2040	2	4,316,027	91.3%	2,317,843	237,830	2,236,014
July 1, 2041	1	2,236,014	95.3%	2,317,844	81,829	(0)
July 1, 2042	0	-	100.0%	-	-	-

Unfunded liability at June 30, 2021 adjusted to July 1, 2022 with payments expected to be made between the valuation date and July 1, 2022. Payment based on 7.50% interest over a period of 20 years beginning on the Fiscal Year starting July 1, 2022.

APPENDIX 2

RISK COMMENTARY

Risk Commentary

The determination of the accrued liability and the actuarially determined contribution requires the use of assumptions regarding future economic and demographic experience. Risk measures, as illustrated in this report, are intended to aid in the understanding of the effects of future experience differing from the assumptions used in the course of the actuarial valuation. Risk measures may also help with illustrating the potential volatility in the accrued liability and the actuarially determined contribution that result from the differences between actual experience and the actuarial assumptions.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions due to changing conditions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period, or additional cost or contribution requirements based on the Plan's funded status); and changes in plan provisions or applicable law. The scope of an actuarial valuation does not include an analysis of the potential range of such future measurements.

Examples of risk that may reasonably be anticipated to significantly affect the plan's future financial condition include:

- **Investment Risk** – actual investment returns may differ from the expected returns;
- **Asset/Liability Mismatch** – changes in asset values may not match changes in liabilities, thereby altering the gap between the accrued liability and assets and consequently altering the funded status and contribution requirements;
- **Contribution Risk** – actual contributions may differ from expected future contributions. For example, actual contributions may not be made in accordance with the plan's funding policy or material changes may occur in the anticipated number of covered employees, covered payroll, or other relevant contribution base;
- **Salary and Payroll Risk** – actual salaries and total payroll may differ from expected, resulting in actual future accrued liability and contributions differing from expected;
- **Longevity Risk** – members may live longer or shorter than expected and receive pensions for a period of time other than assumed; and
- **Other Demographic Risks** – members may terminate, retire or become disabled at times or with benefits other than assumed resulting in actual future accrued liability and contributions differing from expected.

The effects of certain trends in experience can generally be anticipated. For example, if the investment return since the most recent actuarial valuation is less (or more) than the assumed rate, the cost of the plan can be expected to increase (or decrease). Likewise, if longevity is improving (or worsening), increases (or decreases) in cost can be anticipated.

The computed contribution rate shown on page A-2 may be considered as a minimum contribution rate that complies with the Board's funding policy. The timely receipt of the actuarially determined contributions is critical to support the financial health of the plan. Users of this report should be aware that contributions made at the actuarially determined rate do not necessarily guarantee benefit security.

Risk Commentary (Concluded)

Plan Maturity Measures

Risks facing a pension plan evolve over time. A young plan with virtually no investments and paying few benefits may experience little investment risk. An older plan with a large number of members in pay status and a significant trust may be much more exposed to investment risk. Generally accepted plan maturity measures include the following:

	2021	2020
Ratio of the market value of assets to payroll	14.72	11.50
Ratio of actuarial accrued liability to payroll	20.71	19.59
Ratio of actives to retirees and beneficiaries	0.22	0.23
Ratio of net cash flow to market value of assets	-4.3%	-5.1%

Ratio of Market Value of Assets to Payroll

The relationship between assets and payroll is a useful indicator of the potential volatility of contributions. For example, if the market value of assets is 5.0 times the payroll, a return on assets 5% different than assumed would equal 25% of payroll. A higher (lower) or increasing (decreasing) level of this maturity measure generally indicates a higher (lower) or increasing (decreasing) volatility in plan sponsor contributions as a percentage of payroll.

Ratio of Actuarial Accrued Liability to Payroll

The relationship between actuarial accrued liability and payroll is a useful indicator of the potential volatility of contributions for a fully funded plan. A funding policy that targets a funded ratio of 100% is expected to result in the ratio of assets to payroll and the ratio of liability to payroll converging over time. The ratio of liability to payroll may also be used as a measure of sensitivity of the liability itself. For example, if the actuarial accrued liability is 10 times the payroll, a change in liability 2% other than assumed would equal 20% of payroll. A higher (lower) or increasing (decreasing) level of this maturity measure generally indicates a higher (lower) or increasing (decreasing) volatility in liability (and also plan sponsor contributions) as a percentage of payroll.

Ratio of Actives to Retirees and Beneficiaries

A young plan with many active members and few retirees will have a high ratio of active to retirees. A mature open plan may have close to the same number of actives to retirees resulting in a ratio near 1.0. A super-mature or closed plan may have significantly more retirees than actives resulting in a ratio below 1.0.

Ratio of Net Cash Flow to Market Value of Assets

A positive net cash flow means contributions exceed benefits and expenses. A negative cash flow means existing funds are being used to make payments. A certain amount of negative net cash flow is generally expected to occur when benefits are prefunded through a qualified trust. Large negative net cash flows as a percent of assets may indicate a super-mature plan or a need for additional contributions.

Additional Risk Assessment

Additional risk assessment is outside the scope of the annual actuarial valuation. Additional assessment may include scenario tests, sensitivity tests, stochastic modeling, stress tests, and a comparison of the present value of accrued benefits at low-risk discount rates with the actuarial accrued liability.

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November 2, 2021

Secretary of the Retirement Board
City of St. Clair Shores Employees
Retirement System
27600 Jefferson Circle Drive
St. Clair Shores, Michigan 48081

Dear Board Members:

Enclosed are 15 copies of the report of the 69th Annual Actuarial Valuation as of June 30, 2021 for the City of St. Clair Shores Employees Retirement System.

Sincerely,

Mark Buis, FSA, EA, FCA, MAAA

MB:dj
Enclosures

cc: Electronic Copies:
Renae Warnke, City of St. Clair Shores
Susan Kroening, City of St. Clair Shores
Mary A. Kotowski, City of St. Clair Shores